

# FUTURE RESEARCH ON MALARIA: Towards a malaria-free country

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# OUTLINE

NIHRD output indicators

NMCP output indicators

Malaria Elimination Areas

Problems, Challenges and Future Research

Summary

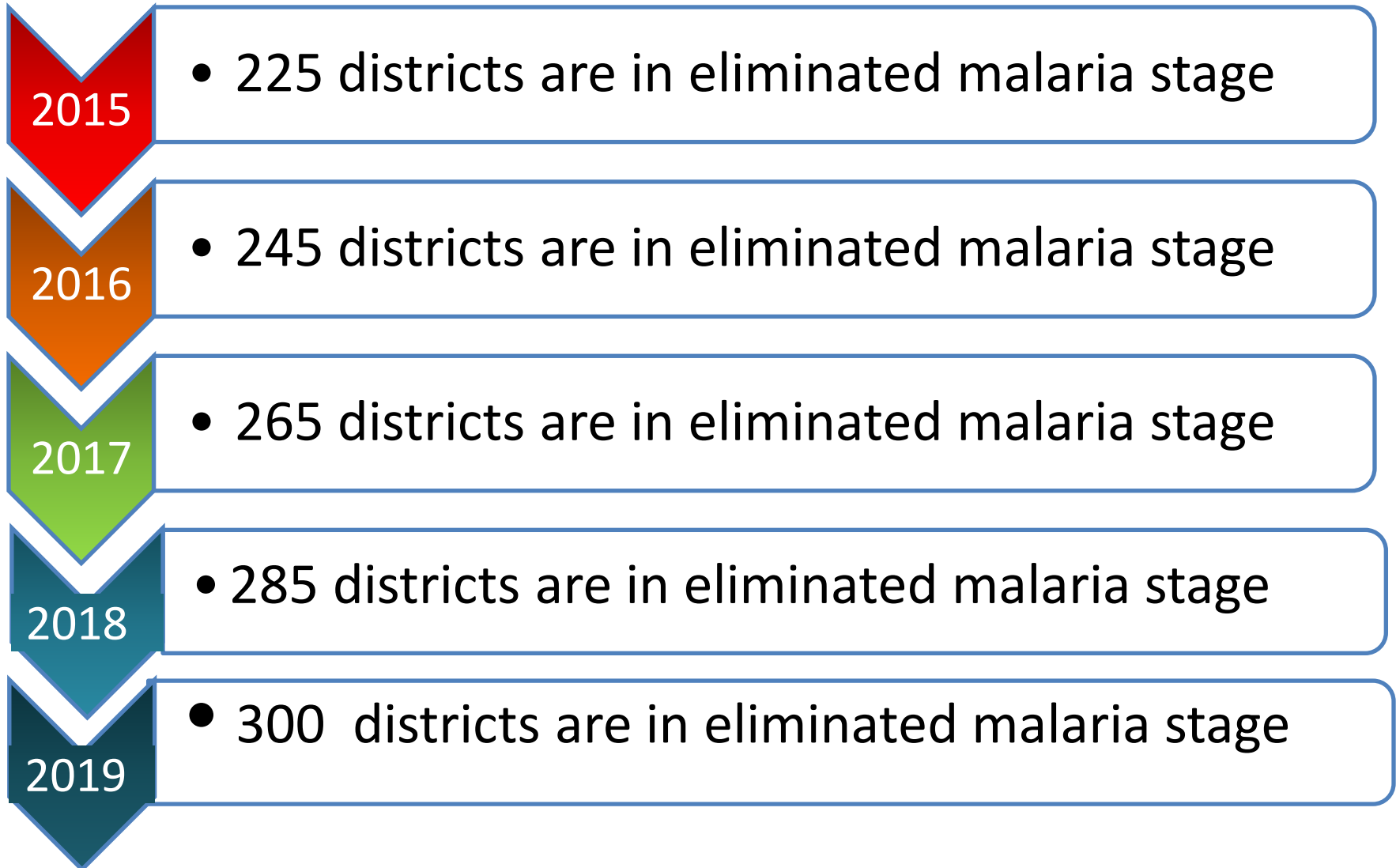
# NIHRD Output Indicators

Recommendation to improve National Malaria Control Program

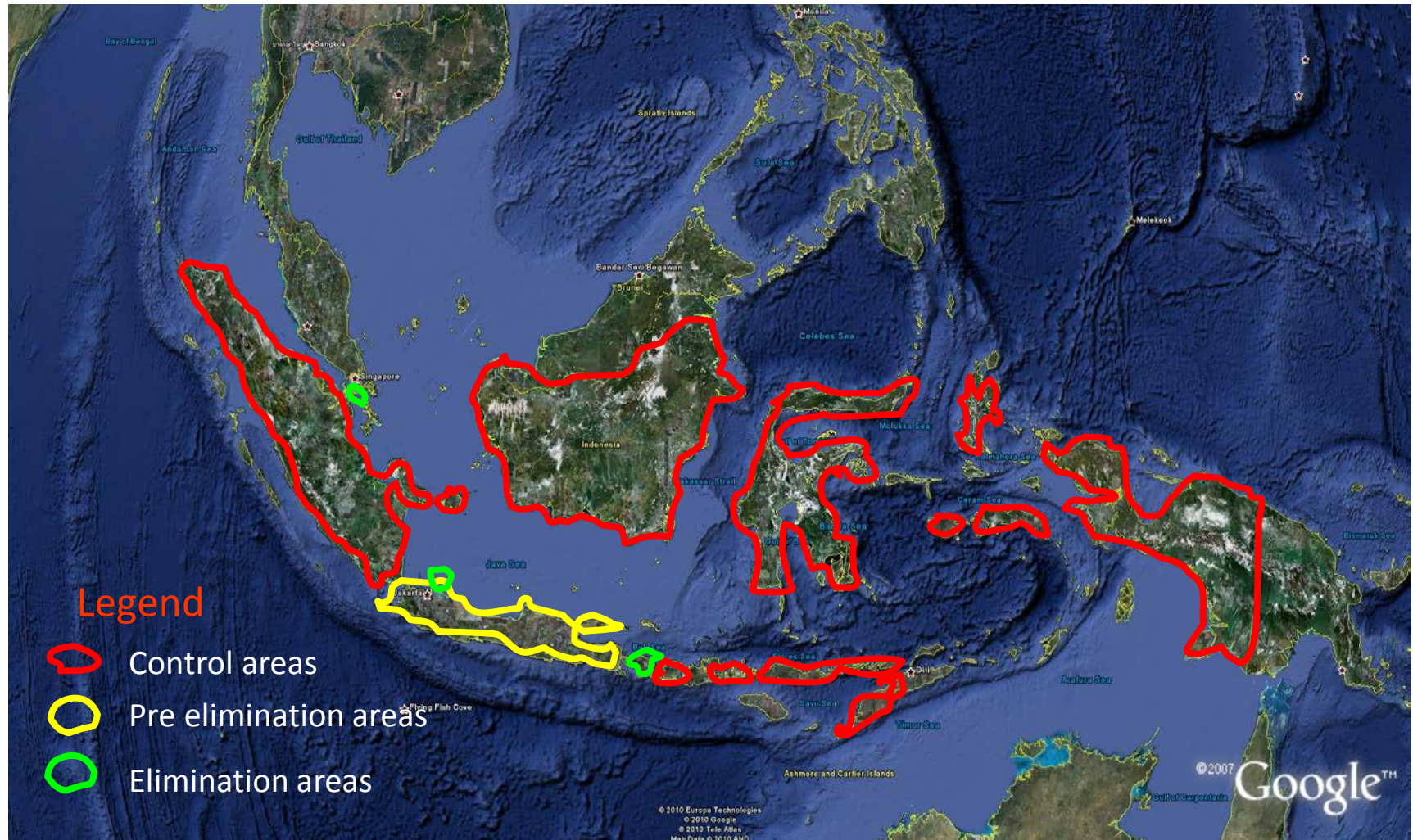
Novelty: Patent, Copy Right etc

Publication

# NMCP Output Indicators



# Malaria Elimination Areas in Indonesia



Subdit Malaria, 2012

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graph BT; Problems --> Challenges; Challenges --> Future_Research[Future Research];
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Future Research

Challenges

Problems

# Epidemiology/Surveillance

- Marker for imported cases
- Prevalence of G-6 PD deficiency
- Marker for *Pv* relapse and resistance
- Mode of *Pk* transmission
- Marker for artemisinin resistance

- Polymorphism of *Pf*, *Pv* and others
- Diagnosis of dormant *Pv* or *Po* and *Pk*
- Distinguishing of *Pv* relapse and *resistance*
- Monitoring therapeutic efficacy /drug resistance

## Towards malaria elimination

- Imported/non-indigenous cases
- Zoonotic *P.kowlesi*
- Spreading of artemisinin resistance

# Diagnosis

- Validated and highly sensitive RDT
- Marker for *Pv/Po* liver stage /hypnozoite/dormant stage
- Marker for *Pk*
- Tools for field G-6PD deficiency test

- Sensitivity of RDT for *Pv* and other non *Pf*
- Diagnosis of *Pk*
- Field G-6PD test

- Microscopist skill
- RDT for *Pf* and non *Pf* (*Pv*, *Pm* dan *Po*)
- None for *P.kowlesi*
- G-6PD deficiency



# Treatment

- Ideal ACT/other antimalarial drugs
- Field drug level/concentration measurement technique
- Pharmacogenome of artemisinin derivatives resistance
- Genotype artemisinin resistance

- Simple and practical alternative ACT
- Baseline PK and PD of ACT program in *Pf. Pv* patients and population
- Other radical treatment regimen

- Endemic malaria country and mostly in remote areas
- All human *Plasmodia* and zoonotic malaria
- Affects all age groups
- Compliance
- Only DP as ACT program
- Decreased ACT efficacy in neighboring countries
- Accelerated malaria elimination

# Vaccine

- Effective polyvalent vaccine
- Vaccine trial

- Vaccine development to prevent infection and relapse/  
disease/transmission

- Migration and mobile population
- All human *Plasmodia* and *Pk*
- Lots of potential vectors
- Health policy priority: promotion and prevention approach

# Summary

Polyvalent vaccine to prevent infection

Rapid and highly sensitive diagnostics to detect *plasmodia*

Ideal antimalarial drug for radical treatment

Field surveillance tools for low incidence and prevalence

*Thank You*